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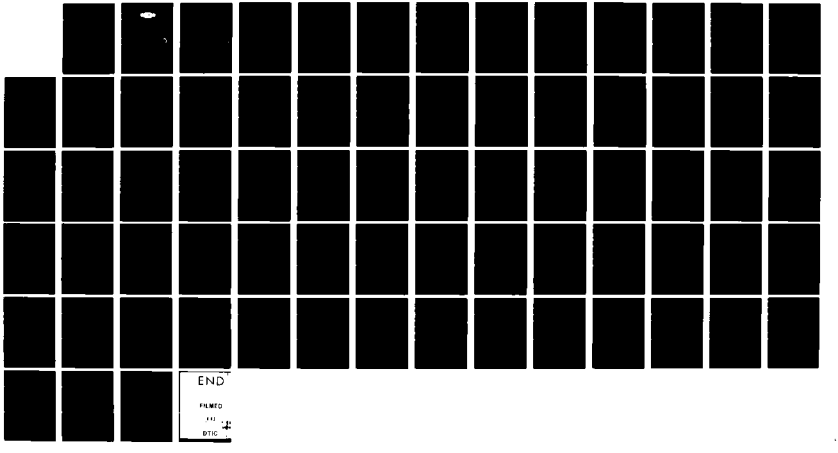

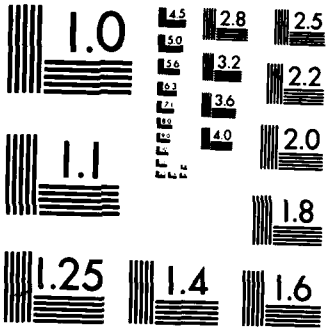

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Organizational Stress: A Literature Review

1974 - 1982

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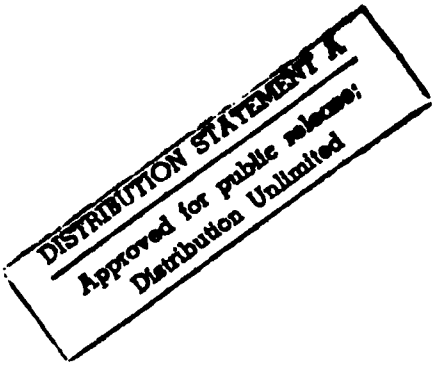

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104 article abstracts, obtained from ~~APA's PASAR service~~, are listed, described briefly and discussed. The most general themes in the discussion are that (a) studies of organizational stress appear to be largely studies of frustration and goal-blocking in organizations, and (b) future research should be more systematic than heretofore.

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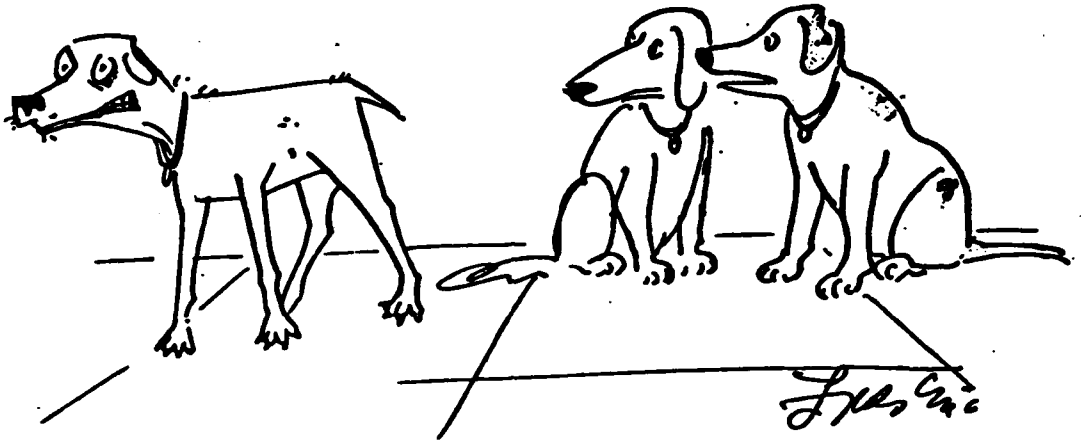

"Stress!"

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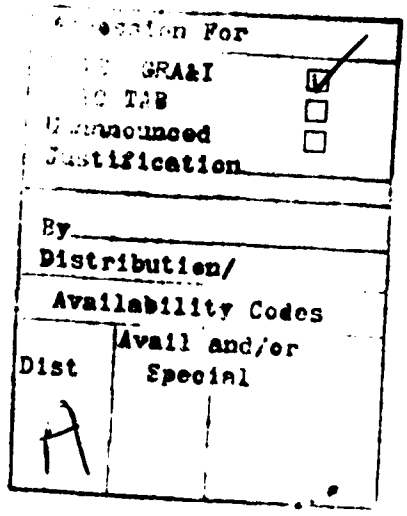

INTRODUCTION

This report stems primarily from the author's personal interest in the subject of psychological stress. As such it complements an earlier report (Lester, 1979) dealing with DOD-funded studies of stress. The present report deals with the open literature appearing in the (mostly) refereed psychological journals. The pool of references for consideration was obtained from the American Psychological Association's Psychological Abstracts Search and Retrieval Service (PASAR); more detail on the PASAR search can be found in Appendix A.

The pool obtained consisted of over 2000 references, but the decision was made to limit this review to those references with some clear bearing on the topic of organizational stress. By organizational stress I mean stress which is intrinsically tied to the nature of an organization or which is especially common in organizations. This sub-topic was chosen because it seems to be the one with the most bearing on the ONR Psychological Sciences contract research program, in particular the Adaptation in Organizations thrust within the Organizational Effectiveness Group. I hope that this review may provide a general information base to anyone interested in the subject.

The 140 articles chosen for review are grouped in this report into a small number of sub-headings, in order to "chunk" the information for the reader (and for myself). These sub-headings are: sources, outcomes, moderators, coping, interventions, methods, and reviews. Obviously many articles fall into more than one of these categories, and this fact is noted where appropriate. It is recognized that other ways of grouping the references are conceivable, but this way seemed persuasive to me.

No claim can be made that this set of references exhausts the literature on organizational stress between 1974 and 1982. No doubt some appropriate articles were not present in the PASAR data base, or were unwittingly excluded by the search strategy. The set here presented, however, should be reasonably representative of the work that has been published in this period, and should suffice to provide a solid introduction to the main

lines of research and theorizing that have characterized the study of organizational stress in this recent period.

Readers who have information about important references that have been left out, or who wish to correspond about interpretations or reflections offered in this report are sincerely encouraged to get in touch with the author.

SOURCES OF ORGANIZATIONAL STRESS

Over 60% of the references turned up in this search could be considered to deal primarily with the question: What things impose stress on people in organizations? The question is an inevitable one, particularly in a field that is in an early state of development. This subset of references will be clustered into three groups for discussion: (a) a general approach to organizational stress; (b) role-related stress; and (c) stress in specific occupations.

A General Approach to Organizational Stress

Buzzard (1974) examines and discusses factors associated with industrial stress. There is evidence, he says, that stress can contribute to poor work, unhappiness, and illness. Examples of stress induced by work are presented "in a framework which suggests what to look for as causes of stress." Schmitt, Colligan and Fitzgerald (1980) collected data concerning mass reports of symptoms and various possible indicants of stress from 826 employees of eight organizations. Their analyses indicated that reported symptoms were related to work pressure, dissatisfaction with company personnel practices, income, and family disharmony. Ivancevich and Donnelly (1975) found that salesmen working in organizations with flat organizational structures (i.e., minimal hierarchical structures) reported lower amounts of anxiety or stress (as measured by a nine-item scale) than did salesmen in organizations with tall or medium structures. Flat structure was also associated with greater reported self-actualization and with more efficient performance. Cummings and DeCotiis (1973) obtained responses to an organizational-climate questionnaire from 133 male employees of an accounting and management services firm. Four general factors related to stress were identified: organizational support and clarity, organizational objectivity and rationality, administrative rationality, and general stress. Ford and Bagot (1978) examined how organizational factors influenced job satisfaction and stress among 22 minority professional personnel in a large manufacturing and sales firm. Organizational factors were reported to have a larger influence on satisfaction than on stress. Cohen (1976) studied male and female workers in both Los Angeles and in Munich. Women

in both places were found to report higher levels of experienced stress, which Cohen attributes to the multiple role responsibilities (wife-mother as well as worker) still applied to women. Workers who have neither upward nor desirable horizontal mobility often report feelings of being "locked in", along with greater alienation and general emotional distress than other workers.

Zaleznik, Kets de Vries, and Howard (1977) examined stress reactions among high-status members of a large organization. Compared with staff and operations people, managers showed a low prevalence of stress reactions. The authors conclude that the role of the environment (particularly bureaucratic structure and the lack of power that it often entails) is to activate anger and defenses against anger; psychodynamic factors affect the tolerance for stress and the choice of syndrome if symptoms indeed appear. Levinson (1980) defines stress as an increase in the distance between the ego ideal (an only partly conscious image of oneself and one's future best) and the self-image. The emphasis in the article is on personality dynamics, especially the management of aggression and dependency, *in relation to group dynamics* and organizational factors. The function of leadership, he argues, is central to the anticipation, alleviation, and amelioration of stress. Rosenthal (1978) discusses some of the stresses of work from a psychiatric perspective; perhaps of special interest is his discussion of major character problems often seen in organizational leadership. Ari Kiev (1974), a well-known psychiatrist, describes sources of tension and anxiety in contemporary corporate life and prescribes techniques for reducing and managing conflict. Major topics include (a) characteristics of psychological stress and self-defeating behavior, (b) procedures for integrating corporate and personal objectives, and (c) recommendations to industry for assessing personnel strength and bettering communication.

In an epidemiological study, Cunnick and Smith (1977) reviewed trends in suicide rates and causes over the last 50 years. An incidental finding was that work-related stress factors influencing suicide include (a) conflicts over policy, procedures, results, etc., (b) frustration of unfulfilled expectations, (c) rapid changes, and (d) role conflicts especially among women. Brodsky (1977) analyzed

33 claims made under Workmens Compensation laws for suicidal acts (nine completed and 24 unsuccessful) attributed to work-incurred physical or psychological injury. Work events leading to suicidal acts included (a) sudden changes in organization, and (b) conflict of loyalties resulting from work change. Brodsky noted that those treating subjects whose jobs were the source of stress usually failed to recognize their patients' desperation and urged them to stay at their jobs.

Sarason and Johnson (1979) investigated the relationship between changes in the personal and work lives of 44 male naval personnel, and their job satisfaction. Results suggested that negative (and not positive) life changes show an association with job satisfaction; negative changes go with lower satisfaction. Implications for assessing organizational stress and for predicting attrition from organizations are discussed.

Cherry (1978) investigated nervous strain at work among a sample of 1415 men, all 26-year-old members of the National Survey of Health and Development. Information was obtained on severity of nervous strain, perceived stressors, and effects attributed to strain. Status level of work was the dominant factor in the analysis; status level was directly correlated with reported level of strain. Susceptibility to anxiety and specific work factors made approximately equally significant contributions to reported strain, after allowance for the level of work. It was concluded that predisposing and precipitating factors made largely independent contributions to the report of nervous strain at work in this sample. Parasuraman and Alutto (1981) used data from organizational records and a questionnaire survey of 217 employees of a medium-sized food processing firm to identify seven sources of stress in the work environment. They found that both type and magnitude of stressors differed significantly among the five subsystems and three job levels of the firm. (A later section will review other moderator variables.) Gupta and Beehr (1979) investigated the relationship between four job stresses (role ambiguity, role overload, underutilization of skills, and resource inadequacy) and two employee withdrawal behaviors. Personal interviews and company records were obtained on 651 employees in five organizations. Job stress proved to be related to subsequent employee withdrawal behaviors (absenteeism and turnover). Blau (1981) used

questionnaire data from 166 bus drivers to evaluate relationships (concerning stress, social support, and job satisfaction) within the J. R. French et al job stress model. Results provided only limited support for the model, and length of service was found to be an important moderator variable to consider in future research.

Mettlin and Woelfel (1974) examined data from 58 rural high school students and more than 750 of their sources of educational and occupational influence, to assess the relative impact of (a) discrepancy among influences, (b) level of influence, and (c) the number of influence sources. Results suggest that a multidimensional conception of the relationship between interpersonal influence and stress seems warranted. Love and Beehr (1981) discuss their recommendations for a broadened perspective regarding social stressors on the job. The suggestions are to (a) search for additional psychosocial stressors, (b) expand the types of social support investigated as moderating variables, (c) research outcomes of job stress other than employee strains, and (d) consider the use of theories other than role theory in developing research hypotheses. The link between on-the-job stressors and off-the-job strains, the joint interaction of social stressors, and the standardization of diagnostic instruments to measure job stress are recommended for examination.

Magnus and Dodd (1981) report an increasing resistance to job-related geographical relocations, based on an anticipation of psychological stress for both the employee and his or her family. This trend is related to the growing preference for lifestyle over career development and to the growing number of two-career families. Company strategies to cope with transfer resistance are recommended. Estes and Wilensky (1978) propose that a great range of behavior and attitudes can be explained by the use of the idea of the "life cycle squeeze" - the change over time in the balance between resources and aspirations, which they propose is usually least favorable in the early and in the late parts of the adult life cycle. Some empirical data are reported (238 professionals) which both match the pattern and show some deviations.

In a study which stands somewhat alone in breaking the notion of "job stress" into components, O'Connell, Cummings, and Huber (1976) treated four measures

of felt tension as variables dependent on (a) information inputs from the environment and (b) the group structure of the decision-making unit. Salient findings suggested that (a) "role overload tension" is positively related to information load, while "generalized tension" is positively related to information load only when information specificity is low; (b) "information deprivation tension" is inversely related to information specificity for hierarchically structured groups but not for groups of co-equals, and "generalized tension" is inversely related to information specificity only at high information loads; and (c) "role overload tension" and "role ambiguity tension" are lower in groups with a structured hierarchy.

Kanner, Kafry, and Pines (1978) have argued that stress research has largely ignored those stress reactions that result from a lack of positive conditions, and the need to consider such lack as a source of stress. They report a study of 84 students and 205 professionals supporting the hypotheses that both the presence of negative and the lack of positive life and work features are (a) both related to tedium and dissatisfaction, and (b) independent of each other in their effects.

Role-related Stress

Research on organizational stress has increasingly been oriented to the concept of role. Katz and Kahn, in their 1978 book The Social Psychology of Organizations, 2nd edition (NY: Wiley) identified role-related stress as perhaps foremost among the social-psychological stressors in organizations, and in his comprehensive chapter reviewing and structuring the field ("Stress and Behavior in Organizations", in Handbook of Industrial and Organizational Psychology, Marvin D. Dunnette, ed. (Chicago: Rand-McNally, 1976)) McGrath identifies role stress as one of his six classes of stress in organizations (the other five are task-based stress, stress intrinsic to the behavior setting, stress arising from the physical environment itself, stress arising from the environment of interpersonal relations, and stress within the person system, i.e., which the person brings with him or her into the situation). "Who works for whom, who communicates with whom, who has influence on

whom - these are questions as basic to one's orientation in 'organizational space' as questions about the location of 'north' are basic to one's orientation in geographical space" (McGrath, p. 1385).

Abdel-Halim (1978) studied the relative importance of three role stresses: role conflict, ambiguity, and overload among 89 managerial personnel of a large manufacturing company; role ambiguity showed the strongest effects.

Miles (1976) measured role requirements and the role conflict and role ambiguity experienced by 202 R&D professionals. Role conflict was more sensitive than role ambiguity to differences in role measurements, and the role requirements of integration and boundary-spanning were the most highly associated with experienced role conflict. In a subsequent treatment of the same data-set, Miles (1977) noted the presence of a threshold effect regarding the stressfulness of a role-set, which could lead to underestimation of a role's potential for inducing stress. Miles and Perreault (1976) tested a comprehensive model concerning role conflict, using multivariate behavioral research methods. Antecedents (i.e., sources) of role conflict included objective role requirements and characteristics of the role set, and consequences included job tension and satisfaction, perceived effectiveness and attitudes toward role-senders. Five distinct conflict orientation groups were isolated, and work-related outcomes were significantly different for individuals in different groups. Bedeian and Armenakis (1981) studied 202 VA hospital staff and showed that role conflict and ambiguity were both associated with high levels of job-induced stress, a finding they take to indicate the importance of role perceptions in understanding job-related attitudes.

Batlis (1980) examined the differential impact of role conflict on three outcome variables; job satisfaction, job-related anxiety, and propensity to leave the organization. Questionnaire responses were gathered from 111 supermarket department managers. As hypothesized the independent variables carried different weights as predictors of the different outcome measures, leading Batlis to argue that the global notion of job stress or job conflict is too general to provide useful information. A more sophisticated attempt to develop subscales measuring

various facets of a role-related construct is that of MacKinnon (1978). He took the Job-Related Tension Index developed in the early 1960s at University of Michigan, obtained responses from two rather different samples, and factor-analyzed the results for the two groups separately, finding a highly stable factor structure. MacKinnon concludes with suggestions for developing a series of homogeneous subscales concerning role strain. A second reference might be made here to the work of O'Connell et al (see page 6) who also attempted to work with a more differentiated notion of job stress.

Organ (1975) tested the hypothesis that task-role ambiguity is aversive in the presence of independently induced pressure, but not aversive in a low-pressure situation; individual neuroticism was hypothesized to be a trait which explained additional variance in reactions to ambiguity. In this study with 106 graduate students, who were administered structured or ambiguous exams under high or low pressure, both hypotheses were confirmed. Role conflict is treated by Lauer (1973), who administered a questionnaire to both parishioners and ministers in order to evaluate attitudes toward the ministry. Results suggested that ministers are required to function in a context of expectations that are incapable of realization; the results are reflected in the ministers' reports of experienced stress and of de-valued self-conceptions. The expectations are conceptualized as aspects of the structural organization of the church, which is therefore considered in need of re-design.

Gavin and Axelrod (1977) considered managerial stress and strain among 95 employees in a mining organization. A number of stresses (such as role conflict and ambiguity, underutilization of skills, job insecurity, and variation in workload) had moderate to high relationships with psychological strain (anxiety-irritation-depression, psychosomatic symptoms, job dissatisfaction). Incidentally, none of 13 potential moderators (including Type-A personality, age, tenure, need for social approval, and flexibility) had an appreciable effect on the stress-strain linkage. Rogers (1977) studied components of organizational stress among Canadian managers (he also has comparative data for American managers although this article does not present them). Factor analysis of questionnaire responses identified four stress factors

labeled as Workload, Organization Structure and Design, Management Responsibility, and Communication and Interpersonal Interaction. Perceptions of stress were not significantly related to the moderators of age, level of education, or type of industry. Dornstein (1977) studied chief executives and boards of 17 public corporations, and found that different types of role conflict (stemming from divergent orientations among executives and boards) were differentially associated with various indices of role stress. Dunham (1978) invited 92 department heads in British comprehensive schools to report on their stress situations, their responses to them, and their recommendations for the reduction of stress. Reported stress situations consisted mainly of role conflict and role confusion; responses included frustration, anxiety, and psychosomatic symptoms; recommendations focused on the development of clear role definition.

Minkler and Biller (1979) define role shock as the stress accompanying either major discrepancies between anticipated and encountered roles or the sudden and significant departure from familiar roles. Their article describes the theoretical properties of the concept and explores its relationship to relevant existing concepts in the social sciences. Jones and Butler (1980) explored the degree to which incompatibility between family and job role demands serve as a source of job-related stress. 181 married sailors aboard four deployed Navy ships responded to questionnaires about job-role conflict and ambiguity, role strain, family/work role incompatibility, and goal attainment facilitation. They concluded that such incompatibility is significantly related to the ease of the role-transition process. The currently popular notion of "burnout" is re-conceptualized as role fatigue by Barbour and Moreno (1980), who assert that the phenomenon is more complex than merely the experiencing of too many demands. It is related to frustrating expectations placed on one, and the authors argue it is important for the victim to become aware that he or she is repeatedly performing a role that is no longer productive to others or satisfying to him or herself. Suggested approaches for role-fatigue therapy are included. Meier (1974) has labeled the threat posed by excessive interaction (to which such positions as editor, scientist, school board member, and top manager or high-level executive are especially subjected) as communications stress. Some methods for achieving more privacy and also stress release are considered.

Stress in Specific Occupations

Colligan, Smith and Hurrell (1977) examined admission records of 22 community mental health centers to determine the incidence rate of diagnosed mental disorders for 130 major occupations. Results indicated a disproportionate incidence of mental disorders among the hospital and health care professions. Adams (1974) analyzes the situation of the psychiatric resident, working within a team-oriented approach to therapy, in terms of a "blurred role", and suggests that common reactions include withdrawal, over-assertion of authority, or excessive anxiety. Cherniss, Egnatios and Wacker (1976) studied "new public professionals" and concluded that role conflict, discussed in terms of Bureaucratic Control vs the Service Ideal, was a major source of stress for them. At its worst, role-related conflict can cause these professionals to blame their clients for not improving or to act toward clients in a de-humanizing way. Cooper, Mallinger, and Kahn (1980) studied the questionnaire responses of 150 British dentists to identify characteristics of their jobs related to stress. Findings suggest that most of the major sources of stress on the dentist are connected with his or her managerial role. The most stressful aspects were "coping with difficult patients" and "trying to maintain a schedule"; a moderate level of stress was reported for "too much work", "unsatisfactory auxiliary help", and "administrative duties."

Stein and Hoffman (1978) conducted interviews with a sample of athletes and found that the modes of role strain experienced by them involved ambiguity of norms, overload of role obligations, role conflict, decreasing internal amd external rewards for role performance, role-intrinsic anxiety concerning physical damage, and structural insufficiency of resources.

Policeman have become popular subjects for study with regard to stress. Reiser (1974) has written discursively examining the stresses on policemen arising from personal problems, the police organization, and the work environment. Kroes et al (1974) interviewed 100 male police connected with car patrol; the interviews suggested that the most important sources of stress were (a) problems with administration (e.g. conflict over work assignment), (b) problems with the courts (excessive leniency), (c) community relations, and (d) inadequate

or defective equipment. The same authors (1974) did structured interviews with 30 police administrators and found the most frequently mentioned stressors to be administrative policies and lack of support from higher-level managers, and work ambiguity (need to make decisions based on insufficient information). These administrators felt beseiged by conflicting demands from superiors, subordinates, and the community, and these stresses were said to have negative effects on family and home life, as well. Hillgren, Bond and Jones (1976) interviewed 20 police chiefs and sheriffs and concluded that (a) many sources of stress were not inherent in the job itself but came from within the organization and its procedures, and (b) there was marked similarity between the sources of stress identified by police officers and by chief administrators.

Payne (1977) measured the "press" expected by applicants to an Australian Officer Cadet School. He also later measured their perceived press as cadets, and found that applicants expected far fewer demands for abasement, adaptability, aggression, and dominance from the environment than they would actually encounter. It was suggested that these discrepancy scores (which might be taken as a measure of role shock) were correlated with measures of satisfaction, leadership performance, academic performance, and a pass/fail criterion, but these relationships were not discussed.

Crowding

More than 30 references were turned up in this search which dealt with crowding, or social density, as a source of stress. I found the decision whether or not to include a review of this subset a difficult one. Certainly unwelcome degrees of social density can be found in organizational settings (e.g., in offices, or aboard US Navy ships, and especially aboard submarines). But it can be argued that this source of stress is not strictly speaking organizational; it can equally well occur in non-organizational settings (e.g., on commuter trains, which have been studied in Sweden), and is therefore not really endemic to the organizational setting. I am not totally convinced by this argument. If one wants to know about stress within the organization known as the US Navy, it might be a mistake to overlook crowding as a source, especially for enlisted personnel. This ambivalence has been dealt with by a compromise; no crowding studies will be reviewed here, but they will be included where relevant in all subsequent sections.

Discussion

The references in this section have been presented as efforts to answer the question, What things impose stress on people in organizations? Do any general outlines of an answer emerge from the consideration of this varied group of studies?

Before attempting an answer one might note the following. How does an investigator find out whether or not a condition is stressful? In most cases he or she finds out by asking how subjects feel in reaction to a certain condition, and looking for replies that explicitly or implicitly contain expressions of tension or dissatisfaction. There is no good definition of a psychological stressor that is independent of responses to stress. Since we use the term as if it could be defined independently of responses to it, this is not very satisfactory. In the individual case, a situation is stressful if a subject says it is stressful.* At the level of the organization, there seems to be no alternative to group consensus as a way of identifying stressful conditions (and there is as yet no standard way of seeking consensual data in this domain). The logical awkwardness here is reflected in the tendency to take "stress" sometimes as meaning an environmental condition that "puts pressure" on the person, and sometimes as meaning the experienced results of an environmental condition. Not infrequently this change in meaning occurs within a given article, e.g., in one article (not topically relevant to this review) the authors begin with the definition: "Stress, in the present review is considered to be physiological consequences of exposure to any aversive stimulus", and then proceed in the rest of the article to use "stress" to refer to the aversive stimulus, as in "Stress exposure has been shown to influence neurochemical, hormonal, and immunological functioning." This

*It may seem that a way out of this would be to use one or more of the myriad physiological indicators often taken to reflect, or even measure, stress. Unfortunately, they do not correlate highly with one another, and none of them correlates reliably with self-reports of "stress"; in cases of differences among the indicators (which is the rule), which one "really" tells the story? A practical solution is to settle on one kind of indicator or measure and study it for all it is worth; in the case of organizational stress, researchers have usually chosen the self-report of some kind of undesirable tension.

interchanging of meaning has not contributed much to conceptual clarity in the research literature. Conceptual mist, if not fog, is indicated by this quote from a recent report, which dealt with "research on the effects upon behavior, of the stressors of temperature, crowding, sleep disturbances, panic, stress, and anxiety." Stress as a stressor? This gives full expression to the tautology toward which we veer.

If one simply lists the sources of stress discussed in each article, a review of the list in search of similarities and generalizations brings one back to some fairly common-sense notions. Organizations divide the "labor" among their members, and each member's position in the organization is characterizable as a role, which is a definition of what is expected from the incumbent and what he or she can expect from people in other roles. Investigators have repeatedly shown, in a variety of contexts, that trouble in an organization's role-system has negative outcomes. The studies described here repeatedly take up the phenomena of lack of clarity in role definition, conflict between or within roles, the incompatibility of expectations with realities. These studies, then, are asserting what the experience of most adults also asserts, viz. that if one is not clear about what one is expected to do or not to do as part of the job, if one is expected to do incompatible things by different parts of the organization, or if one cannot obtain the resources to accomplish what is expected, then there is going to be trouble of some kind (at the very least, tension or dissatisfaction). A general factor which might be called the perceived feasibility of meeting expectations will go a long way to subsume the various sources of stress mentioned in the references presented here. The implicit outcome for individuals experiencing role conflict, ambiguity, or overload, and for individuals hampered in their efforts to fulfill expectations or reach goals, is the familiar psychological state of frustration. Even some of the sources of stress discussed in language other than role-related (e.g., the relative absence of organizational objectivity and rationality, distance between ego-ideal and self-image, skill underutilization, life-cycle squeeze, and geographical relocation) can be thought of as leading to a final common pathway, which ends in frustration. The special frustration discussed by Levinson, of a gap between the ego-ideal and the self-image, is probably of outstanding importance.

In talking about stress, we may not be talking about anything which has not been studied and discussed within a different semantic framework.

OUTCOMES OF ORGANIZATIONAL STRESS

A second major cluster of studies has concerned itself with questions relating to the nature of the effects, or outcomes, that can be expected under stressful conditions. A number of the studies previously described under Sources (see pages indicated) include discussions of stress outcomes, e.g.:

- absenteeism and turnover (Gupta and Beehr, p. 5)
- lowered satisfaction, tension, propensity to leave (Bedeian, et al, p. 8)
- anxiety, lowered satisfaction, propensity to leave (Batlis, p. 27)
- job-related tension and dissatisfaction, decreased perceived effectiveness, increased negative attitude to role-senders (Miles and Perreault, p. 8)
- anxiety-irritation-depression, job dissatisfaction, psychosomatic symptoms (Gavin and Axelrod, p. 9)
- frustration, anxiety, psychosomatic symptoms (Dunham, p. 10)
- anxiety, over-assertion of authority, withdrawal (Adams, p. 17)
- emotional distress; medication use; cardiovascular, gastrointestinal, and allergy-respiratory disturbances (Zaleznik, et al, p. 4)
- de-valued self-conception (Lauer, p. 9)

The following discussion deals with those references in which the main emphasis appeared to be on outcomes.

Physiology, Health, and Well-Being

Hennigan and Wortham (1975) evaluated the impact of job activity on heart rate (HR) among 24 males with an age range from 27 to 55. Two EKGs were obtained from each subject, each covering a six-to-ten-hour work-day; subjects also recorded activities of the day in a personal diary, making possible a correlation of activity with HR. Results indicated that situations identifiable by Ss as potentially stressful can cause elevated HR. 70% of

the time the period of highest daily recorded HR coincided with non-physical work. Hauenstein, Kasl, and Harburg (1977) examined the blood pressure (BP) levels of 508 married women in relation to such work-related variables as workload, reported strain, satisfaction with work and performance evaluations. Some of the results obtained were: (a) currently unemployed working women had lower BP levels than those employed; (b) among employed women differences in workload were unrelated to BP levels; (c) housewives reporting tension about housework and being critical of own performance had higher BP levels; and (d) working wives with a strong commitment to the work role had high BP levels. Cobb (1974) collected data on men who were about to lose their jobs, and showed that the stress of anticipated termination increased the output of norepinephrine, serum creatinine, serum uric acid, and serum cholesterol. Levels on these variables were higher if the subjects were coffee-drinkers, had more recent life-changes, had less social support, and were less dependent psychologically.

Conway, Vickers, Ward, and Rahe (1981) conducted a longitudinal field study to investigate the effect of occupational stress on self-reported cigarette, coffee, and alcohol consumption. Subjects were 34 US Navy petty officers in training to be company commanders. Group results showed that the chronic tendency to perceive high stress was associated with habitual coffee and cigarette consumption, but not with alcohol consumption. Consumption of all three substances varied significantly across days that differed in perceived stress level; cigarette and coffee consumption went up with stress, while alcohol consumption went down. However, it was noted that these general effects appeared to depend largely on the behavior of only a few of the subjects, and the authors point out, for the benefit of constructors of models of behavioral responses to stress, that there are likely to be important individual differences in the tendency to increase or decrease substance consumption in response to varying levels of stress. Beehr and Newman (1978) have undertaken to review considerable empirical research on job stress and employee health (for more detail see page 41). Adams (1981) discusses an approach to preventative health that integrates considerations of stress and health habits with an understanding of "how stress operates in modern organizations" and what it can do to organizational members.

Greenberger and Steinberg (1981) compared 212 10th and 11th graders holding their first part-time jobs with 319 youngsters who had never worked, with respect to self-reported frequency of psychological and physical health symptoms, school absence, and use of cigarettes, alcohol, marijuana, and other drugs. These variables were examined in the working group as a function of exposure to six types of job stress, and in both groups as a function of significant life changes. Interestingly, workers (especially boys) reported fewer somatic symptoms than nonworkers, and boys who worked under stress reported fewer somatic and psychological symptoms than boys who held less stressful jobs. Exposure to job stress was related positively to alcohol and marijuana use for both boys and girls. Some stressors were sex-specific: constraints on autonomy adversely affected boys but not girls, whereas an impersonal work setting adversely affected girls but not boys. General life stress did not serve to amplify the effects of job stress. House et al (1979) examined the cross-sectional association of 12 measures of perceived stress to self-reported symptoms of ill-health and also to five confirmed medical conditions. In 1,809 white male blue-collar workers, perceived stress was consistently and positively related to self-reported angina, ulcers, and neurotic symptoms and to medical evidence of hypertension and other heart disease risk factors. Perceived stress seemed to exacerbate the harmful effects of exposure to potentially noxious physical-chemical agents.

Kets de Vries (1978) has proposed a conceptual framework indicating four possible reactions of managers to midlife transition as a stressor: constructive, underachieving, defensive, and depressed. Corwin (1980) obtained questionnaire data from 250 wives of US Air Force junior officers which showed that missile-launch officers' wives perceived more stress in their marriages and life style than did wives of other officers whose jobs were more regularly scheduled. The most dissatisfied group of subjects were missile launch officers' wives who were married less than three years, were college graduates, were not working, and whose husbands were not career officers. Beckman, Marsella, and Finney (1979) compared levels of depression among 24 wives of nuclear submarine personnel under conditions of husband-presence and husband-absence in a cross-over research design. Results highlighted the tremendous

stresses imposed on the wives as a result of the nuclear submarine deployment schedule, and the authors note the failure of the US Navy and the spouses to recognize and reward the wives for their efforts to cope.

Discussions of stress can easily become discussions of the quality of life. The Center for Stress Research in Stockholm has made this connection explicit as a basis for its work. A recent example found in Frankenhaeuser (1977) lies in the gray area between "occupational" and "organizational" stress but has implications for many work situations. On the basis of a review of work relating to the impact of technology on workers' health and satisfaction, she argues that key components in the quality-of-life concept are a moderately varied flow of stimuli and events, and opportunities to engage in psychologically meaningful activities and to exercise personal control over external conditions.

Other Outcomes

In an experimental analog of "the harassed decision maker", Wright (1974) gave 210 male undergraduates five pieces of information to assimilate in evaluating cars as purchase options. Three groups operated under varying time-pressure conditions, while another three operated under varying levels of distraction. The hypothesis that judges operating under either kind of stress would systematically place greater weight on negative evidence compared to controls was supported. Subjects also attended to fewer data dimensions under stress. Janis and Mann have concerned themselves in two references (1977a & 1977b) with a theory of decision-making under stress which addresses itself particularly to the effects of warnings and confrontations with danger. The theory includes a typology of five distinctive patterns of coping behavior (from hypervigilance to defensive avoidance) and a schema for decision-making stages. The authors illustrate their theory with discussions ranging from laboratory experiments to biographical material, and suggest some new interventions for facilitating adaptive behavior in emergencies.

Morris et al (1976) carried out an experiment with 70 college students which showed that groups awaiting a fearful event spent more time interacting "in the service of social comparison needs" than did groups facing anxiety or ambiguity. Groups in the fear condition also developed a higher degree of cohesiveness. Sohlberg (1973) describes some specific war conditions and related combat reactions observed during the Yom Kippur war of October 1973. It is noted that in interpreting battle reactions in combat soldiers, due weight should be given to variables like ego-involvement and commitment to one's country, beyond the more general variables related to the unavoidable stress and strain of combat conditions.

Fodor has reported a series of studies, all using an industrial simulation experiment in which subjects act as supervisors of a supposed work-crew. In the group-stress condition one member of a crew disparages both the experimental task and the supervisor; in a neutral-condition control group no such disparagement occurs. In a study of ingratiation (Fodor 1973) 54 male undergraduates served as supervisors; results were contrary to expectation, in that a simulated ingratiator failed to receive a more favorable performance evaluation from the supervisor than a non-ingratiating member of similar performance, regardless of the presence or absence of group stress. In a second study (Fodor 1974) using male college freshmen as subjects it was found that supervisors who rated the group stress as high distributed rewards among the group differently than did those who rated stress as low; specifically, they gave higher creativity ratings to a worker who criticized the supervisor's performance, and higher pay raises both to the critic and to a noncritical compliant worker. In two more recent studies Fodor (1976 and 1978) used actual foremen as subjects, and showed that group leaders subjected to group stress adopted a significantly more authoritarian mode of control of the group, and also gave lower pay increases and lower performance evaluations (as compared to leaders of neutral groups) not to critical, disparaging group members as one might have thought, but to compliant members.

Beehr (1981) interviewed 651 employees of five midwestern work organizations, regarding three role stresses and five employee outcomes. As hypothesized,

each stress was most strongly correlated with dissatisfaction with the source of the particular stress, second most strongly correlated with dissatisfaction with co-workers, and least strongly correlated with dissatisfaction with the nonsocial aspects of the work role. Beehr concludes that people who experience job stress blame the social system in the organization, resulting in their dissatisfaction with co-workers, who are the elements of that system. Pichevin and Rossignol (1975) showed that the experience of stress influences perceptions of the relations within a group. They did this using as subjects 63 students, who were asked to imagine relations within six groups, each representing a different group structure. Between the first and the second of the tasks, subjects were divided into two groups, one of which took a test under non-stress conditions, the other under stress conditions. Divergence between the two groups took place only after the stress induction.

Cohen (1980) has reviewed the literature relevant to his proposal that the aftereffects of stress on performance and social behavior are attributable to a depletion of attentional capacity, which he refers to as "cognitive fatigue." Cohen and Spacapan (1978) tested the hypothesis with two experiments, which showed that the same effects could be produced either by a stressor (noise, crowding, or shock) or by having subjects perform a secondary, attention-demanding task.

Discussion

The references presented here were clustered to try to answer the question as to the nature of the outcomes that can be expected under stressful conditions. Can we generalize about outcomes?

First, as already noted a great many of the reviewed studies are based on self-reports of tension and dissatisfaction; such dysphoric feelings are almost part of the defining characteristics of the notion of stress, but may also be thought of as perhaps the most commonly found outcome of organizational stress.

The research literature leans heavily in the direction of searching for other negative outcomes (as contrasted with positive outcomes). Health-related negative outcomes are prominent, and this line of research is the one that sticks most closely to Selye's (1952) original concept. At the physiological level, it is clear that various kinds of stimuli that can cause people to report tension, dissatisfaction, and the like can also alter physiological functioning - increase heart rate, blood pressure, change both absolute and relative amounts of catecholamine production, etc. (it is not clear that these are negative outcomes, though this interpretation is often implied). This line of research has quite a long history, antedating Selye. What is new is (1) an extension of the range of stimulating conditions that can alter physiological functioning (from doing arithmetic problems in a laboratory, to working as a policeman or air traffic controller), and (2) an increase in the sensitivity of biological assay methods which now permit a much more complex picture of bodily reactions to stressful and other stimuli. At a more macro level many studies have attempted, more or less successfully, to relate stressful conditions to the likelihood of appearance of various medical conditions - angina, hypertension, ulcers, cancer, to mention just a few. A collection of studies centered on organizational stress per se does not turn up many studies focusing on medical outcomes, but they exist and are relevant to organizational stress.

In the present set of studies other outcomes noted include cognitive and perceptual ones, at the individual level, and social ones. In the cognitive domain, it has been noted that "the harrassed decision maker" makes decisions differently under stress, and that in a stressed group actions in the service of social comparison needs may increase. It has been proposed that "cognitive fatigue" or an attentional deficit is the explanation for the effects of stress on performance and social behavior. In the perceptual domain, it has been argued that stress changes the perception of relations within the group, can change a leader's appraisal of subordinates' performance, and can make an employee dissatisfied with co-workers. The Janis and Mann theory posits five perceptual reactions under stress, from hypervigilance to defensive avoidance. At the social level, stress may affect a leader's mode of group control (toward authoritarianism).

A wide range of possible outcomes has thus been demonstrated, from changes in heart-rate to changes in mode of group control. However, far too little work has been done in these explorations to permit statements about boundary conditions on relationships found. Is the stress represented by a critical employee equal to that of information overload in its power to influence social attributions, or to induce gastrointestinal symptoms? How far can the notion of an attentional deficit be pushed as an explanation of stress outcomes? Is hormonal output under stress in any way related to substance abuse? All the answers that might influence individual action or organizational policy appear to require more comprehensive and especially more systematic research than is now going on.

VARIABLES MODERATING STRESS IN ORGANIZATIONS

In a number of studies the design or discussion includes attention to actual or possible moderating factors. These might operate either to influence whether or not a particular stressor is present in a subject's environment, or to influence whether or not a particular subject will experience strain from a particular stressor. Some of the studies previously abstracted under either Sources or Outcomes included attention to moderators as well; e.g.:

- o race, Type A personality, anxiety, higher-order needs (Ford and Bagot, p. 3)
- o job level, subsystem of a firm (Parasuraman et al, p. 5)
- o length of service in the firm (Blau, p. 5)
- o level of job enrichment (Abdel-Halim, p. 8)
- o information load, group structure (O'Connell, Cummings, and Huber, p. 6)
- o conflict orientation groups (Miles and Perreault, p. 8)
- o organizational level; various unspecified interpersonal indices (Bedeian et al, p. 8)
- o age, level of education, type of industry (Rogers, p. 9)
- o age, tenure, need for social approval, Type A personality (Gavin and Axelrod, p. 9)
- o employed vs unemployed, self-criticalness, commitment to the work role (Hauenstein et al, p. 17)
- o coffee drinking, recent life changes, degree of social support, adequacy of psychological defenses (Cobb, p. 17)
- o unspecified individual differences (Conway et al, p. 17)
- o sex, type of stress, life changes (Greenberger et al, p. 18)
- o job level, psychodynamic factors (Zaleznik et al, p. 4)
- o ego-involvement, commitment to country (Sohlberg, p. 20)

The references discussed below have not been previously described in this report, which means that they appear to put their major emphasis on moderating variables as they relate to organizational stress.

Miscellaneous Studies

Tung (1980) gave a 35-item questionnaire (Administrative Stress Index) to 108 female and 1048 male school administrators, and found that females reported lower levels of self-perceived occupational stress than males. Posner and Randolph (1980) investigated the effects of role ambiguity and role conflict by questionnaires administered to 155 health workers. These role stresses were negatively correlated with job satisfaction, individual performance, and unit effectiveness, but moderator effects for "participation in decision-making" and "tolerance for conflict" were not found. Herrmann et al (1977) studied adaptation to stress in the US Naval Academy by comparing 16PF scores of 34 plebes who dropped out before the end of the 1st semester for nonacademic reasons with those of 391 who remained. Dropouts scored lower than those who remained on the 16PF factor reflecting group-dependence, suggesting that affiliation with others can aid efforts to cope with some kinds of stress.

Cooper and Green (1976) assessed the demographic and psychometric characteristics related to task performance, supervisory skills, personal skills, and conduct during a period of relative isolation and confinement for 64 British Royal Air Force personnel. They report that "a number" of 16PF traits and "certain" demographic factors moderated the effect of the stress on work performance and conduct. Kanekar, Neelakantan, and Lalkaka (1975) studied 192 Indian female college students working on a multiple-solution anagram task, and found that the effect of the high-stress condition on performance was greater for real than for nominal groups.

Several studies have studied stress as itself a moderator variable, moderating the relationship among other factors. Organ (1975) administered exams which were either structured or ambiguous to 106 graduate students, under either a high or a low pressure condition. Attitudes toward the exam and self-confidence

were negatively affected by ambiguity only under high pressure. Schriesheim and Murphy (1976) examined the effects of four situational moderators, including job stress-level, on relationships between leader behavior and subordinate satisfaction and performance. Data from respondents in a social service organization confirmed earlier findings that in low-stress jobs the leader behavior of Consideration enhances satisfaction and performance, but that in high-stress jobs it is Structure that is helpful. Klein (1976) carried out an experiment with 14 male college students using a task which required subjects to retrieve their wooden cone through a common hole (meant to be analagous to a theater fire with only one narrow exit). The dependent variable was the level of responsibility attributed to a leader by members of his group as a function of four variables, one of which was level of stress (threat of shock or of small monetary loss). Results showed that elected leaders were attributed with more responsibility and were seen as more competent than appointed leaders, but only when the stress was comparatively low.

Larson and Rowland (1973) tested a group of highway engineers on the Bureau of Business In-Basket Test, administered under stress and nonstress conditions. Results were analyzed separately for engineers high and those low on Fiedler's Least Preferred Coworker dimension, and it was found that stress reversed the behavior patterns of the two groups. Under low stress, the high LPC engineer showed more task behavior and the low LPC engineer more interpersonal behavior, but under high stress the most salient behaviors shown were reversed. Fiedler et al (1979) report four studies in military organizations providing consistent evidence that if a subject's stress with his immediate superior is high, the subject will fail to use or will misuse his intelligence in performing his job; while if the relationship with the superior is non-stressful the subject uses his intelligence effectively. The reverse was true for the use of experience: it was used effectively when stress was high but not when it was low. In a similar study with 130 US Coast Guard officers, petty officers, and civilian employees Potter and Fiedler (1981) found that when stress with boss was high, then experience correlated positively but intelligence correlated negatively with performance evaluations. When reported stress with boss was low, intelligence was uncorrelated with performance.

Several studies of crowding have focused on moderating variables. Dooley (1975) carried out an experiment in which social density was varied, and showed that males with "far" personal space preferences experience greater crowding stress than those with "close" personal space preference. Aiello (1977) extended this work, using 32 female undergraduates under several levels of short-term crowding. Subjects preferring far inter-personal distances showed the greatest electrodermal responses to crowding and later reported having experienced the greatest somatic stress. Baum, Harpin, and Valins (1975) hypothesized that membership in groups in crowded settings would reduce the likelihood that residents would feel crowded. Results of a survey showed that residential groups were less likely to form in crowded environments, but that when they did form they served to reduce experienced crowding and stress for their members.

Environmental Moderators

Brief et al (1979) studied type of nursing education as a moderator of the impact of role stresses on nurses. They found that role stress increased with degree of professional training, and that this was unrelated to time on the job. Moch, Bartunek, and Brass (1979) studied 655 employees in 55 departments of public utility companies to learn about how the structure or task context facing role senders affects the stress experienced by role receivers. Relatively lower stress was expected to be reported from employees whose supervisors (a) had less formalized roles, (b) engaged in extensive horizontal contacts, and (c) received performance feedback from the task and from their own supervisors. In general the data supported the hypotheses, but there were unexpected variations in the results, e.g.: (a) formalization of the supervisor's role was associated with stress only for technical (and not professional) personnel; (b) feedback was significantly associated with stress only for professionals; (c) the frequency of horizontal contacts was not a moderating factor; and (d) although workflow centrality was positively associated with stress for technical personnel, it was not associated for professionals and negatively so for managers. Beehr (1976) examined three situational characteristics (group cohesiveness, supervisor support, and autonomy) as possible moderators

of the relationship between role ambiguity and four psychological strains. 651 adults in five midwestern work organizations were given 90-minute structured interviews in their homes. Group cohesiveness moderated the relationship between role ambiguity and two of the role strains but the direction of its moderating influence was inconsistent. Supervisor support was nonsignificant as a moderator. Autonomy significantly moderated the stress-strain relationship in the expected direction. Justice, Gold, and Klein (1981) gave a battery of instruments to 54 males and 134 females, mostly in positions of a counseling and social work nature. A measure of "burnout" was included, and results indicated that negative life change events may promote or aggravate burnout, but also that positive events will "buffer" the impact of stress.

Support from other people as protection against stress is a growing subject for research. Kyriacou (1981) discusses the relationship between social support and the actions used by teachers to cope with stress. He emphasizes that there are different types of social support that serve different ends, and these types of social support underly a range of coping actions. Dean and Lin (1977) attempted to identify empirical, theoretical, and methodological problems connected with the notion of the stress-buffering role of social support. LaRocco and Jones (1978) pitted two models of how support relates to the effects of stress against one another in a study based on questionnaire responses from 3,725 US Navy enlisted personnel. Results favored the hypothesis that stress and support each exert a direct effect on such outcomes as satisfaction, self-esteem, and retention, and thus that the two factors are simply additive in their effect. Results generally failed to support the hypothesis that support acts as a buffer against stress for such outcomes. However, in a second study LaRocco, House, and French (1980) collected data from 636 men in a randomly stratified sample of 23 occupations. The additive hypothesis was supported for job-related strains such as dissatisfaction and boredom, but the buffering hypothesis was supported for mental and physical health variables.

Personal Characteristics

One of the most frequently studied personal characteristics in relation to stress is Rotter's "locus of control" (internal vs. External). Anderson (1977) obtained data from 90 small business owner-managers as part of a study of the effects of a major natural disaster. Data were collected at two points in time over a 2 1/2 year interval, and included locus of control, perceived stress, coping behaviors, and performance (credit ratings). Internals perceived less stress, and employed more task-centered and fewer emotion-centered coping behaviors. The successful Internals became more internal during the study, whereas it was the unsuccessful Externals who became more external. Batlis (1980) examined the possible moderating effect of locus of control and job involvement on the relationships between role stress and several individual outcomes, using 111 supermarket managers, without finding any significant moderating influences. Keenan and McBain (1979) looked at potential moderators between several role-stress measures and psychological strain, in 79 male and 11 female middle managers in a large public organization. Role ambiguity was significantly associated with high tension at work in those managers with External locus of control but not in Internals. The effects of role ambiguity were also moderated by scores on the Budner Scale for Tolerance-Intolerance of Ambiguity, in the expected way, and managers with Type A personality showed stronger relationships between role ambiguity and strain than those with Type B. Kyriacou and Sutcliffe (1979) surveyed 130 comprehensive school teachers in England, and found self-reported occupational stress to be positively associated with high External scores on Rotter's Locus of Control scale.

Bedeian, Armenakis, and Curran (1980) correlated a set of Adjective Check List scores with reported role stress in a group of 202 nursing personnel. They report a number of significant correlations, but all of relatively low magnitude (e.g., .17 with defensiveness, .20 with aggression). Organ found that task ambiguity led to greater reported emotional stress only in high-neuroticism individuals (measured by the Eysenck Personality Inventory). In a study of members of a white-collar union in a manufacturing company, Beehr, Walsh, and

Taber (1976) showed that relationships between role stresses and outcomes (job dissatisfaction, fatigue, and tension) were moderated by higher-order need strength. Heisler and Gemmill (1977) found that for managers across a variety of organizational settings job strain was positively correlated with scores on Machiavellianism. Kobasa (1979) studied two groups of executives who reported comparably high degrees of stress over a three-year period. One group of 86 suffered high stress without falling ill, while 75 others reported becoming sick after their encounter with stress. The high stress/low illness group showed more control, commitment, and interest in change as a challenge. Renshaw (1976) studied managers in a large multinational corporation who were undergoing three specified kinds of organizational stress. Feelings of influence over stressful events (obviously related to the locus of control concept) was found to be a significant factor in both organizational and family effectiveness. Helliwell (1981) discusses the concept of "burnout" in terms of an individual's temperament and potential for it, as well as discussing burnout in organizations, changes in a person's life pattern that may lead to burnout, and occupations that are burnout-prone. She suggests that the most likely victims are people with high expectations and a sense of purpose; high idealism and a single-minded life purpose are said to be characteristics often associated with burnout.

Discussion

All studies of the sources and/or outcomes of organizational stress find considerable individual differences. Even such highly potent stressors as role conflict, or being the wife of a nuclear submarine officer, do not have the same effect across all subjects. This research finding, as well as everyday experience, suggests that there exist factors which can moderate between stress stimuli and their consequences.

The set of references under consideration include attention to more than 37 potential moderator variables. It may be useful to list them, clustered by general classes:

demographic	employment-related	social-psychological
age	type of stress	type of group
sex	type of industry	group membership
race	subsystem of firm	degree of social support
level of education	organizational level	group cohesiveness
recent life changes	job level	
	length of service	
	information load	
	performance feedback	
	supervisor support	

personal characteristics

Type-A personality	anxiety	personal space preference
various 16-PF scale scores	need for social approval	
Fiedler's LPC scores	self-criticalness	
various Adjective Check List scores	higher-order needs	
Neuroticism (Eysenck)	ego involvement	
Machiavellianism	commitment to work role	
Locus of Control	interest in change as challenge	
	high expectations	
	sense of purpose	
	adequacy of defenses	
	psychodynamic factors	

Almost all of these variables have demonstrated the ability to moderate the relationship between at least some stressor and some outcome. Leaving aside undoubted differences in quality of design and data collection, these data present us with a daunting picture. Having seen that a large number of facets of life in organizations (which may, however, be largely an aggregate of things that produce goal-blocking and anticipation of unfulfilled expectations) can be called stressful, and that the range of outcomes of these stressors is quite large, we now find a somewhat appalling number of variables which can moderate the stressor-outcome relationship. Very few of the variables listed above have received the attention of more than one study (according to the results of this review). For what it is worth, the variable most often looked at has been the Rotter Locus of Control Scale (four studies).

Which of these moderators have the most power for any particular relationship, or across the most relationships? Do any of them have significant interactions?* It is repetitious to say it again, but one cannot avoid concluding that all the hard work lies ahead of us, in the form of more systematic programs of research on moderator variables, tied to particular stressing conditions and/or particular stress outcomes.

*The number of possible interaction pairs among 37 variables is 666.

COPING WITH STRESS

The connection between stimuli and response is not a direct one; rather it goes through the person, who acts upon stimuli in some way and who chooses responses to some extent. People attempt to cope with their environment, and the research literature reflects some attention to this aspect of stress. Some studies have focused primarily on the coping process, while others (previously described under other headings) have touched on the subject in a secondary way.

Studies Primarily Focused on Coping

Newman and Beehr reviewed medical and psychological literature on ways to handle stress on the job. The paucity of research in this domain and the lack of involvement by industrial and organizational psychologists are emphasized.

In a discursive article Dimsdale (1978) underlines the essentially warlike connotations of coping,* and discusses coping in an ancient community, a military command, and among survivors of Nazi concentration camps. He suggests that coping may have effects that are beneficial in the short run but ominous in the long run. Pridham (1977) provides a theoretical formulation based on the work of W. R. Bion that incorporates a concept of stress intended to permit analysis of group moves and individual mechanisms to resolve stress. Galano (1978) has put together a handbook of techniques for dealing with stress.

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* The classical and medieval roots of "cope" converge on a set of meanings (now archaic, of course) centered on to break, to strike, or to fight. In Shakespeare's time it meant something like to meet or to encounter, especially as in battle or combat. For current definitions, Webster's Third New International Dictionary gives: "2 a: to maintain a contest or combat usually on even terms or with success . . .b: to face or encounter and to find necessary expedients to overcome problems and difficulties."

Robbins and Tanck (1978) obtained questionnaire data from 132 college students on ways of diminishing tension. A factor analysis yielded the following patterns: seeking social support, dysfunctional behavior, narcotizing anxiety, problem solving, reliance on professionals, bearing with discomfort, and escape. Ilfeld (1980) abstracted information on coping from interview data from 2,299 Chicago-area adults, and described coping styles used to combat stressors in the social roles of marriage, parenting, finances, and job. Factor analysis here produced three major patterns: taking direct action, rationalization/ avoidance of the stressor, and acceptance of the stressful situation without attempting alteration. Respondents did not consistently utilize one coping style across all role areas, but rather employed a repertoire of responses. Rogers (1977; see p. 9) used a questionnaire to study the components of stress among 113 Canadian male managers. Cluster analysis identified five groups of individuals with different stress frequency patterns, and the labels given them suggest that these groups might each be characterized by a different coping style: Organization-Centered, Achievement-Centered, Ambiguity-Centered, Equalization-Centered, and Self-Actualization-Centered.

Studies Previously Described Under Other Headings

Anderson (1977; see p. 29) studied 90 small business owner-managers to follow the effects of a major disaster. Choice of coping style interacted with locus of control: internals employed more task-centered coping behaviors and fewer emotion-centered coping behaviors. (The abstract does not mention any relationship between coping styles and business performance.) Janis and Mann (1977; see p. 19) present a theory according to which effective emergency decisions are most likely to be made when the coping style called "vigilant" is dominant. They describe four conditions necessary to this style: (a) awareness of serious risks if no protective action is taken, (b) awareness of serious risks if any of the salient protective actions are taken, (c) moderate or high degree of hope that a search for information and advice will lead to a better (i.e., less risky) solution, and (d) belief that there is sufficient time to search and deliberate before any serious threat will materialize. They contend that when one or another of these conditions is not met, a defective coping style will be dominant, such as "hyper-vigilance" or "defensive avoidance."

A more extended treatment of the theory is found in Janis and Mann (1977). In discussing "the midcareer conundrum" Kets de Vries (1978; see p. 18) proposes a conceptual framework indicating four possible reactions of managers to the stress of midlife transition (these categories appear to reflect possible outcomes of the coping process rather than the coping processes themselves): constructive, underachieving, defensive, and depressed. Suggestions are made of the ways individuals, organizations, and society can prevent or limit the dysfunctional effects of midlife/midcareer passage. Kyriacou (1981; see p. 28) discusses the actions used by teachers to cope with stress, with special emphasis on how social support underlies a range of coping actions.

Several of the references deal with coping with the stress of crowding. Greenberg and Baum (1979) studied ongoing coping processes as 32 undergraduates prepared for anticipated crowding, and obtained evidence of social withdrawal as a response to crowding, with the coping processes sensitive to changes in the extent of the anticipated crowding. Schopler and Stockdale (1977) suggest that interference with goal-directed behavior is the central threat of stress in crowded situations, and that the success of coping with interference problems is the critical mediator between stress and behavioral consequences. They describe a field study of dormitory residents which supports their position. In a similar vein, Sundstrom (1975) hypothesized that stress in crowded situations depends on interpersonal disturbances such as intrusion and goal blocking. His experiment varied social density, degree of intrusion, and degree of goal blocking. Social density did not intensify responses to intrusion or goal blocking, but these conditions did lead to lower affiliative behavior and this was seen as a coping response to interpersonal disturbances. In this experiment intrusion was more effectively dealt with than was goal blocking. Van Groenou (1977) discusses housing conditions, crowding, and stress in Indian cities and rural areas, with particular attention to the subjective withdrawal patterns that are used to mitigate the effects of the obnoxious environment.

Discussion

From the relative number of references found, the design of studies to

detect a stress effect appears considerably easier than the design of studies to capture the ongoing, dynamic process of coping.

What generalizations do these studies permit concerning how people "find necessary expedients to overcome problems and difficulties"? It appears that research on this question is still largely at the level of asking people how they deal with tension, and clustering the obtained replies in some qualitative way. Chicago-area adults were seen as coping in one or more of three ways: taking direct action, rationalizing/avoiding the stressor, and accepting the situation. College students were seen as coping in one of seven ways: seeking social support, relying on professionals, dysfunctional behavior, narcotizing anxiety, escape, problem solving, or bearing with discomfort. One theory groups coping behaviors into two large clusters: task-centered vs. emotion-centered; another into three: hypervigilance, vigilance, and defensive avoidance. The stress of crowding seems to be most often dealt with by social withdrawal or decreased affiliative behavior.

There are suggestive ideas in all of this, but certainly no definitive typology of coping behaviors. It may be that the only course open to researchers at this point is to explore, with the population in which they are interested, what methods are used to reduce those tensions in which they are interested. The exploration may draw on ideas about coping techniques already put forward, but the field is also open for new ideas. Fruitful conceptions probably already abound, e.g., in the fields of clinical, social, and cognitive psychology.

INTERVENTIONS

A handful of reports, mostly ones which have already been described under other headings, has addressed itself to the question of what can be done to mitigate the effects of stress.

Kiev's book (1974) after describing sources of tension and anxiety in contemporary corporate life prescribes echniques for reducing and managing conflict. The emphasis appears to be on procedures for integrating corporate and personal objectives, based primarily on the idea of self-actualization and crisis intervention models. Kuna (1975) presents research findings concerning the positive effects of Transcendental Meditation on work adjustment and performance. Field and Olsen (1980) present a newly developed multi-modal stress-management program geared to managers in an industrial setting to help them reduce physiolcgical tension via autohypnosis and alter stress-producing behaviors through cognitive re-structuring techniques. Jaremko (1979) reviewed research concerning the process and effect of "stress inoculation", concluding that the available research is marked by great procedural variation. A model of the process of stress inoculation is proposed, having an educational-rational component, a rehearsal component, and an application phase.

Allen and Blanchard (1980) evaluated a program of stress management training involving 30 middle-level managers from a large corporation. The training combined frontal and other site EMG biofeedback, progressive relaxation and breathing exercises, cognitive stress management, and generalization techniques. The biofeedback-based training condition did not achieve a consistent advantage over control conditions. Two experiments by Forman (1981) evaluated the effects of stress-management training on school psychologists and the services they provide. Compared with a control group, those psychologists who completed a cognitive-behavioral training program reported decreased anxiety and increased job satisfaction. Karlin et al (1979) used an experimental analog of mass transportation crowding to study the effects of four therapeutically based interventions. All four interventions served to reduce pulse-rate increases during crowding. Two of the interventions showed significant decreases in skin-conductance level compared to controls. An intervention that increased feelings of control over the environment resulted in a more positive view of

the environment but did not have a more significant effect on physiological arousal than did interventions that did not increase perceived control.

Barbour and Moreno (1980) discuss role fatigue, which they consider the essence of "burnout", and suggest approaches for role-fatigue therapy. Daley (1979) explores why caseworkers in protective services are especially susceptible to becoming emotionally burned-out and describes strategies for the management of stress and prevention of burnout among workers. Kets de Vries (1978) notes the increasing use of part-time psychiatrists, psychologists, social workers, and mental health consultants to help managers cope with everyday work problems, and indicates that the focus of such stress-management programs has shifted from treatment to prevention. Adams (1981) provides a protective health-management paradigm, and describes two impact studies suggesting that training in stress and life-style management has a positive outcome in a significant number of cases. Dunham (1978) described the sources of stress for department heads in British comprehensive schools, and provides recommendations for reducing role stress which focus on the development of clearer role definitions. Levinson (1980) emphasizes the role of leadership in the anticipation, alleviation, and amelioration of stress, and the necessity for leaders to deal with the ministration, maturation, and mastery needs of those under them. Finally, the model proposed by Janis and Mann (1977) includes the suggestion of new interventions for facilitating adaptive behavior in emergencies.

Discussion

Clearly the research base from which one might hope to derive the design of intervention programs is thin; the reasons for saying this have been put forth in previous discussion sections. The relative power of various potential interventions has hardly been explored. The trainability of various techniques is relatively unestablished. The matter of individual differences will eventually have to be dealt with, at least from the point of view of building a knowledge base for a training technology.

Even without these boons, however, stress management is becoming a popular addition to the list of modules offered by the training departments of

large organizations and by consultants to industry. With the acceptance of such a module, helpers and change agents gain another tool for their effort to improve the quality of life in organizations, and to put the control of individuals' health and well-being more in their own hands. Relaxation techniques are important elements. Most stress management programs concentrate on helping the individual to monitor and control physiological responses (partly a way of training people to look for signs of stress or tension); on identifying trouble-causing stress responses (from teeth-grinding to short tempers or apathy) and changing them (usually by behavioral modification or biofeedback techniques); and on altering the person's ways of looking at himself or herself and the surrounding situation (cognitive re-structuring). The best stress management programs orient the trainee to look for sources of stress not only in his or her immediate environment, but also in more distant features of the environment, such as the design of the department or of the larger organization, and to look for the stress imposed by the larger structure on those who are in a position to impose stress on him or her.

Evaluation is difficult. Significant stress management programs are usually multi-modal, and it is impossible to disentangle the outcome effects of the various modes presented. The specification of desired outcomes is a knotty problem, both scientifically and also in terms of conflicting values within an organization; helping people feel less tension may sound like a self-evident value to many, but may not be self-evident to efficiency-oriented executives who have to approve such programs and who have to answer to superiors who are primarily interested in "productivity" or "readiness."

Nevertheless, the growth of stress management programs appears, on the face of it, to be a step in the right direction for the person who feels alone and inarticulate in his or her uncertain efforts to grapple with life in an organization.

METHODS

It may be useful to isolate those references that appear to have the most to say about methodological issues.

Matousek and Hladky (1971), in a review of the application of the concept of stress to modern work and work organizations, argue that a multivariate systematic approach to evaluating stress is called for. Weyer and Hodapp (1975) constructed 14 scales, by factor-analytic and item-analytic methods, to measure perceived threat as defined in Lazarus' 1966 psychological stress model. The scales are reported to have reliabilities sufficient for group comparisons. Tracy and Johnson (1981) examined two frequently used scales developed by J. R. Rizzo to measure role conflict and role ambiguity in work environments, and concluded that Rizzo's own data suggest that the scales are misnamed; the conflict scale has more to do with generalized stress, and the ambiguity scale more to do with role comfort. The meaning of these two scales thus needs clarification. MacKinnon (1978) addresses the concept of role strain. He factor-analyzed data on the Job Related Tension (JRT) Index developed at the University of Michigan, and showed an invariance of factor structure across two widely differing samples. He gives suggestions for developing a series of homogeneous subscales to tap the various facets of the construct of role strain. Manning, Ismail, and Sherwood (1981) studied the influence of role conflict on various dependent measures, and conclude that their study shows the importance of using interdisciplinary dependent measures (e.g., physiological, affective, and performance), and also shows the feasibility of using simulations to study organizational stress. Hornung (1977) deals with another role-related kind of stressor, status inconsistency, and presents a method for measuring it that permits a comprehensive test of inconsistency theory without the complicated statistical problems that have plagued previous research.

Dean and Lin (1977) offer a comprehensive review of the notion of social support as a buffer against stress, and include a clarification of methodological and theoretical problems, and some proposals for approaching problems of measurement and research design. Love and Beehr (1981) make recommendations for broadening the research perspective on social stressors

on the job. They also argue that such research be integrated with stress-management programs, and suggest specific research designs for evaluating such programs. Beehr and Newman (1978) reviewed empirical research on job stress and employee health, and discussed some major research problems in this domain: (a) confusion in the use of terminology regarding the elements of job stress, (b) relatively weak methodology within specific studies, (c) lack of systematic approaches in the research, (d) lack of interdisciplinary approaches, and (e) lack of attention to many elements of the specific facets contained in their model.

Loo (1973) discusses several factors which create research problems in studying the effects of crowding and density on humans, and defines future research needs in this area.

Discussion

Obviously there is not sufficient information in abstracts of research to allow a discriminating discussion of the methodology used in those studies. It may be worth noting that among the studies reviewed in this report it is possible to count at least 23 different ways of measuring experienced stress, which run from simple open-ended questions to factor-analytically-derived questionnaire scales, with many intermediate possibilities also represented. With the exception of Kahn's Job-Related Tension Index, which was used or mentioned in a number of references, nobody's method appears to be very interesting to anyone else. If research organized around the concept of organizational stress is to cumulate toward a reliable body of knowledge, some refining and standardizing of methods for approaching it would seem to be a useful focus for effort. It may be that a variety of methods is required, but we ought to work toward greater clarity as to the purposes, advantages and disadvantages of each method considered useful.

LITERATURE REVIEWS

The reader may want to know what other reviews of the literature were turned up by this search. Many if not most of the references listed include some attention to relevant literature; however the following ones may be classed primarily as reviews.

Matousek and Hladky (1971) present a review (although with only 15 references) of the application of the concept of stress to modern work and work organization. Human stress reactions are considered in terms of motor, cognitive, and physiological functioning, and a multivariate systematic approach to evaluating stress is called for. Schuler (1980) argues that there is no common definition or conceptualization of stress, and attempts to provide one. Several propositions and methodological considerations are suggested. (While not strictly a literature review, the generality of this paper made it seem appropriate for this section). Hinkle (1974) reviewed the historical development of the concept of stress (he himself has been involved with the subject over a considerable period of time) and concluded that the concept was heuristically valuable in the past but is no longer necessary. (It would be most interesting to check the referencing of this article by other authors since 1974, but I have seen no sign that Hinkle's conclusion has influenced the field.)

The relation between stress and health is a topic on which articles accumulate rapidly. Cooper and Marshall (1976) attempted to provide a framework for examining work relating occupational stress to physical and mental illness, and reviewed the literature specifically relating to coronary heart disease and mental ill health (83 references). By emphasizing the medical evidence they hoped to encourage greater interdisciplinary work in the field of occupational stress. Beehr and Newman (1978) reviewed empirical research on job stress and employee health within the context of a model which included the following seven facets: environmental, personal, process, human consequences, organizational consequences, time, and adaptive responses (see also p. 41). Colligan and Murphy (1979) reviewed published and unpublished reports of the organizational occurrence of mass psychogenic illness. Factors such as

boredom, sex-role identification, interpersonal conflict, and physical stress are identified as precipitating conditions.

Cohen (1980) reviewed 86 references concerning the aftereffects of stress on human performance and social behavior. The review suggests that a wide range of situations involving a lack of predictability and controllability over a distracting stimulus, from electric shock to "bureaucratic stress", can negatively affect performance and reduce social sensitivity. Several theories are examined but Cohen concludes that the reliability and generality of such stress effects have many causes. Esser (1973) reviewed 34 references dealing with crowding, proposed a paradigm for viewing the topic, discussed the significance of crowding for human evolution, and underlined the consequences of crowding for physical and social planning.

Dean and Lin (1977) provide a "selective" review (12 references) of empirical knowledge regarding the stress-buffering role of social support, and further (a) examine the nature and significance of social support systems, (b) clarify some methodological and theoretical problems, and (c) propose some approaches to problems of measurement and research design. Jaremko (1979) reviewed research concerning the process and effect of "stress inoculation", concluding that the available research is marked by great procedural variation. A model of the process of stress inoculation is proposed, having an educational-rationale component, a rehearsal component, and an application phase.

ALSO INTERESTING

Two of the studies turned up by this review are not adequately relevant to have been included in previous sections of this report, but are too interesting to leave out. My own interest in stress began with an opportunity to study, in the field, an American mountaineering expedition to Mt. Everest (Lester, 1980). It was therefore interesting to find that several related studies have been done in the intervening period.

Gjuric (1974) selected nine out of 22 applicants for a geological expedition to a Mongolian taiga*, using psychological tests, questionnaires, sociometric measurement, interviews, and observation. After ten months the participants were re-examined. Findings showed that (a) the group appeared to have been relatively free of interpersonal conflicts, and it is concluded that the selection process contributed to this result; (b) contrary to expectations, the social isolation, sexual deprivation, and the climate were not significant stressors; and (c) most of the determinants influencing the life of the members of the expedition were connected with their individual personality disposition and characteristics.

In what sounds like a more comprehensive study, Genoves (1977) studied 11 volunteers left on a raft in the Atlantic Ocean; the "experiment" grew out of the more limited raft studies of Ra 1 and Ra 2 (led by Thor Heyerdahl). He was interested in studying the interpersonal relationships (particularly friction and violence phenomena) as they were affected by family patterns of behavior, attitudes toward sex, race, nationality, verbal and non-verbal communication, personality and character, intelligence, language, religion, leadership roles, and space. Intelligence and personality of the 11 members (six female and five male) were assessed by crew members and by shore-based scientists. Predictions concerning the likely outcome of this long period of unavoidable proximity to ten other individuals were made by a variety of scientists and others. Perhaps the most interesting finding was that practicing artists showed better predictive powers concerning the outcome of the voyage than either natural or social scientists. It is suggested that laboratory as

*Your guess is as good as mine.

well as paper-and-pencil assessments may not be related to assessed performances under stress, and that further progress in understanding human hostility will depend on a better knowledge of individual interactions.

Discussion

It is interesting that these are the only two studies found in this review that deal explicitly with the importance of one individual's reactions to another's personality. In my own experience, a great deal of the tension experienced within organizations is attributable to friction between individual personalities. Granted that some of this can be re-conceptualized as role conflict, and granted that some role conflict can be mis-construed as personality conflict, it still seems to me that these are two separable issues and that personality incompatibility is a major contributor to the stress felt within organizations. Does the literature contain so little reference to it because it is such a sensitive matter to study, or because it is more acceptable to talk about role-related concepts? Perhaps this illustrates an important function of the "stress" concept; it allows people to discuss otherwise sensitive and difficult issues, without a sense of exposing all of one's most intimate and personal weaknesses.

CONCLUDING COMMENTS

I have suggested that the study of stress in organizations appears to be largely the study of how organizations create frustration for individuals, and of what consequences can follow from this. Most of the studies reviewed in this report were based on interviews or questionnaires, asking people to report on their experience of stress in their jobs and organizations. However, there is no unambiguous, precise language for probing the experience of stress. In some cases people may have been asked about "stress" per se, in others they may have been asked to explore aspects of their work that made them "uncomfortable", "dissatisfied", "anxious", and the like; the abstracts on which this report is based in no case include a statement of the wording of questions used. The range of wordings used in the probing may in itself be a condition determining the results. There is some evidence that different questions produce somewhat different results, and this means that how one operationally defines "stress" makes a difference to the findings of research. In the absence of systematic exploration, however, we don't know just what difference it makes. In any case, most would probably agree that to the extent that stress means "anything not otherwise clearly defined that produces a negative outcome" it is degraded in its utility for producing theoretical useful results.

There is enormous variability among persons as to what generates frustration or triggers anxiety, and as to what people do about it once generated or triggered. This variability has to do with attitudes, expectations, perceptions, cognitive structures, and the like. To the extent that the phenomena of stress in organizations are largely phenomena of frustration and goal-blocking, the nature of stress and stressors is going to be elusive, changing over time for a person, changing from one person to another, and changing for large groups as one goes from one geographical location, socioeconomic class, or historical period to another. Stress in organizations, one may safely say, is nothing like stress in Selye's (1952) original sense, in which different noxious stimuli all reliably produced a common, non-specific response sequence, from adaptation to breakdown. There are commonalities in the domain of

psychological stress, of course: it appears that at least in America, in this particular period, most workers will label role conflict or ambiguity as stressful. But among those who do so label it there is no great commonality of response; some will be frequently absent from work, some will quit the job, some will feel inadequate, some will perform below their ability, and one may decide to shoot the boss. Others, however, will joke about it, some will concentrate on hobbies, some will find a philosophical rationalization for it, some will just accept it, and some won't even notice. It is no wonder that it is hard to cumulate or model the research findings on "stress." We are probably on the edge here of the debate between the nomothetic and idiographic approaches to psychological questions.

Folk wisdom has it that "everyone has his breaking point", and it is to this wisdom that the modern scientific notion of stress has become assimilated. The common-sense notion of stress has shown a tendency to become reified, to carry the impression of referring to something objective and unitary, something for which a popular metaphor might be the weight imposed on a bridge. Weight varies unidimensionally, and it doesn't matter whether it is produced by commuters in passenger cars or trucks full of oranges; when a certain point on the scale is reached the bridge collapses. We seem to find this useful as a metaphor in thinking and talking about our own lives and situations.

Scientific studies of psychological stress, organizational stress in particular, seem to show us people reacting to "that which blocks my way to important goals." The implications of this way of construing stress do not lead toward a unitary concept. Rather they lead toward a greater appreciation of individual differences, the matching or mismatching of individual goals, values, and ego-ideals with the varieties of potentially frustrating or threatening environmental conditions. Everyone may indeed have his or her breaking point, but only in terms of particular kinds of pressures (frustrations, threats) impinging on particular aspects of the person. Psychological stress lies, not in the world out there, but in the relationship between a person and his or her world. The search for universal laws of organizational stress can be described (I suggest) as a search for

general laws of frustration, threat, and anxiety, and a great body of information already exists to indicate that situational and personal variation is the rule in these matters. What commonalities are likely to be found under the rubric of "stress" are likely already to have been found under other rubrics, and the evidence suggests (to me) that the variability accounted for by general laws will be insignificant for most purposes compared to that controlled by situational and personal particularity, and their interaction.

All of this can be made into an argument in favor of abandoning the generalized definitions of stress and devoting research attention instead to the particular kinds of stimulating conditions one is interested in, without any preconception that study results can be generalized to a wide variety of other stimulating conditions via the mediating concept of stress. Such an approach would lead toward a systematic program of studies concerning a particular variable, say role conflict, or even a certain kind of role conflict. This program would establish the range of organizational conditions that can be said to fit the definition, define the range of possible outcomes when those conditions are met, and define the moderating variables influencing the relationship between role conflict and any particular outcome in which one is interested. Any generalities that might emerge from a set of such programs would have a firmer empirical base than now appears to exist, or to be in the offing.

There is another and very important kind of utility, however, in a global concept having to do with negative outcomes at work, which ought to be mentioned. Such a concept is powerfully useful to those whose mission is to advocate attention to the more subtle and elusive effects of work on well-being. It is fairly easy to rally management support for the re-design of a machine that has a proclivity to mash the hand of its operator - there is nothing subtle about this outcome or the mechanism that produces it. But the relation between gastric ulcers and the nature of managerial work is not so obvious, and for those who have a stake in doing so it is an easier connection to deny. Arguments about worker well-being based on "frustration" or "anxiety" seem to have limited power, because (in my view) the culture makes it easy to label those experiences as "subjective" and therefore not quite real. As subjective experiences (imaginary?) they should be manageable by will-power and strength of

character. The notion of human "stress", on the other hand, arose in the context of a prestigeful profession (medicine) and a scientific laboratory (Selye's), and is (I propose) more easily seen as something real, something that can take its place along with noxious fumes, overly loud noises, and excessive cholesterol as a producer of negative outcomes, about which somebody ought to do something. This is certainly utility of a kind (provided there really is a connection, e.g., between ulcers and managerial work). Change agents might be worse off without it. For that matter, individual employees might be worse off without it. If the notion of stress makes it easier to think clearly about negative aspects of work or family, without guilt or shame, then that too is a clear kind of utility. While "stress" may have lost its utility for researchers, as Hinkle has suggested, it is a long way from losing it for organizational practitioners and perhaps for employees themselves.

Conventional research on stress might well continue to search for some kind of consensus concerning those aspects of life in organizations that have negative impacts on the greatest number of people. Results are likely to be influenced by many methodological, contextual, and moderating factors, and the generality of results may be fairly low. But at least whatever generality emerged would be empirical rather than assumed. With refinement of methods, and systematic planning of series of studies, a decent theory centered on the concept of stress might evolve. Whether or not such a theory would improve the design and delivery of "stress-management" training is a moot question. So far these training modules seem to have been based far more on insights and practices from the clinical field (idiographic) than from normal science (nomothetic), with "stress" as a useful label on the package. Unquestionably we need more evaluations of such training.

A focus on selection rather than training might orient stress research in another direction. It might be productive for researchers to seek ways to characterize organizations (or subunits, or roles within subunits, etc.) in such a way as to promote the selection of employees who will not suffer by being hired into them. It would be novel, to say the least, to think of including in a job description an account of the kinds of frustration most likely to be

engendered by the job. If such characterizations could be complemented by descriptions of individuals with regard to what kinds of frustrations they could deal with most and least effectively, the foundation would be established for a new kind of job-person matching, to take its place alongside the task-demands vs. aptitudes kind of matching. It is of course not certain that this would improve personnel practice, but it seems a worthy effort to engage in at least for those jobs where stress can be shown to be a significant factor.

APPENDIX A

Details of PASAR Search

Three separate requests were made to PASAR. The first of these was in June 1977 and it asked for the most recent 800 references (this constraint was dictated by cost considerations) concerning "psychological stress". The search request included, as descriptors relevant to dependent variables: stress, health, performance, coping strategies, and threat; and as descriptors relevant to independent variables: stress, threat, trauma, workload, personality, and social processes. Only studies using humans as subjects were considered. The earliest among the resulting set of 800 references were from 1974 (vol. 51, Psychological Abstracts), and the sequence ran, of course, into 1977 (vol. 57, Psychological Abstracts).

In early 1981 a request was submitted to PASAR for an updating of the reference pool, using the same search strategy as used in 1977. This produced another 1418 references, with some small amount of overlap concerning 1977. No effort had been made to this point to limit the search to "organizational" stress.

Finally, in April of 1982, when I had realized that some selectivity in the review was necessary, the third request went into PASAR, this time with the search limited to references dealing with organizational or occupational stress and appearing in Psychological Abstracts since the last item in the 1981 set. This produced an additional 89 references.

The 1977 and 1981 PASAR searches produced a total of 2196 articles, from which were culled all those which seemed to have some bearing on the topic of organizational stress. To these were added the 1982 set, which by search definition had some bearing on this topic, giving a total of 241 articles to consider for review. In the end a number of these 241 articles were excluded as being either too "popular" and superficial in their treatment or as not tying in closely enough to the defined subject area, leaving a final total of 140 articles for review in this report.

My original intent was to categorize the very large number of references

produced by this search in the same way the DOD-funded references had been categorized, which would have provided an index as to which sub-topics in the domain were heavily weighted with studies and which sub-topics were lightly covered. This categorizing has in fact been carried out, but the vast number of references (over 2000) makes a parallel report to the earlier one simply impossible, within the time constraints which apply. This is why I decided to limit this review to organizational stress.

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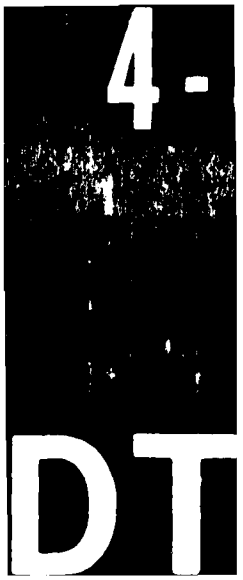
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